Reflection: measuring angles from the normal

Teacher / technician

YEAR 10 / LESSON 53 / PHYSICS + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Record actual measurements separately from labelled practice examples.

Coverage and delivery

Shared Physics / Double Award: 3.9, 3.14, 3.15. Reflection and the law of reflection.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, ten groups of three

Item	Per pair / setup	Class total
LED ray box and suitable low-voltage source	1 per group	10 sets
Mounted plane mirror	1 per group	10
Protractors, rulers and paper	1 set per group plus spare paper	10 sets; 50 sheets
Booklets	1 per learner	30

Immediate safety

Use low-voltage LED ray boxes, not lasers. Keep beams on the bench and never look into them. Check mirrors for chips and keep them mounted. Secure leads and switch off before moving equipment. Leave room lighting sufficient for safe movement.

Preparation and delivery

Read alongside the student method

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1. Check ten mirrors and LED ray boxes. Identify the reflecting surface and pilot the main ray trace.

2. Provide five fresh tracing areas per group and demonstrate the correct protractor scale.

Close of lesson

• Switch off, collect mirrors safely in their holders and retain labelled ray traces.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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- Perpendicular to the reflecting surface at the incidence point.
- i = r.
- Those are complementary angles, not the defined incidence/reflection angles.
- It improves the direction estimate.
- To include repositioning and tracing uncertainty.
- 35°, as a prediction rather than a measured result.

References and provenance

Pearson Physics specification

IOP: reflection and refraction

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.